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GEOLOGY.

ANCIENT REPTILES OF THE CONNECTICUT VALLEY. — Professor Cope has noticed in the "American Journal of Science," the bones of the *Megadactylus polyzelus* of Hitchcock found at Springfield, Mass., and infers that they "demonstrate the former existence in the region in question, of a typical form of the suborder, or order *Symphypoda*, and one nearer the birds than any other hitherto found in America." "That animals of this genus made some of the tracks similar to those of birds in the red sandstones of the valley of the Connecticut there can be no doubt," and the author adds that there is abundant reason that they progressed by leaps.

THE RATE OF GEOLOGICAL CHANGE. — Mr. H. M. Jenkins writes on the rate of geological change, in the "Quarterly Journal of Science," and comes to the conclusion that

"Whether we measure the relative lapse of time occupied by the successive events of geological history by the known facts of the accumulation of deposits, or by the comparative changes which have occurred in the life of successive periods, we are led equally to infer that the *rate of geological change* has been more rapid in the latter than in the earlier geological periods, and that that rate has increased progressively from the earliest to the latest times."

MICROSCOPY.

AIR-TIGHT SPECIMENS. — When shall we cease to suffer from the directions sometimes given to mount dry specimens in a cell of pasteboard or paper, fastening the glass cover down by "a little gum" or "paste?" Of course dust or moisture soon accumulates in the cells, or fungoid vegetation grows until it becomes a beautiful and conspicuous specimen; but in any case the original object is tolerably certain to be marred or ruined. I not unfrequently see collections of specimens, by popular makers, which have perished in this manner. Lately I lost in this way a very choice specimen prepared by one of the best European makers, whose work is usually faultless; and still later, having occasion to remount a group of diatoms which had been bought at a considerable price, I found the thin glass-cover supported at its four corners by little pieces of pasteboard, and fastened down by pasting over its edges the handsome paper cover of the slide. I have not yet seen any of Bicknell's beautiful specimens prepared in this slovenly manner, but scarcely any maker seems to be entirely exempt. I know of no cure for this state of things except for microscopists to refuse to buy any specimens, except those mounted in balsam, which are on paper-covered slides. Working microscopists can, and often do, preserve dry objects in cells of paper and pasteboard, an arrangement which is both convenient and economical; but such preparations should always be carefully protected by Brunswick black or some other impervious varnish. — R. H. W.

THE FOCAL LENGTH OF MICROSCOPIC OBJECTIVES. — Mr. C. R. Cross has ably discussed this subject in the "Franklin Journal." He remarks: "The investigation of which the present article is a summary, was undertaken in order to see if some reliable method of measuring the focal length of microscope objectives could not be found. The importance of such a method will be apparent to all who have had occasion to make use of objectives by different makers. The focal length of lenses of the same denomination is subject to so great a variation that comparison of these by means of their assumed focal lengths too often gives no true idea of their relative excellence. For example, if two quarter-inch objectives be compared, and one gives results much superior to that given by the other, we cannot be at all sure that the better lens is not really of shorter focus than its designation would indicate." He presents a table giving "the results of several hundred measurements on various objectives, and suggests that an examination of the table will show that the focal length of the objectives of some makers differs considerably from the length marked upon them. For example, No. 34 marked 1-2 inch is really a 1-3 inch objective; No. 33 marked 1-4 inch is really a 1-5 inch; No. 29 marked 4-10 inch is really a 1-4. Lens No. 14, marked 1-4 inch, is really a 1-5 inch; but Nos. 13, 15, by the same makers, are correctly designated 1-5 inch, 2-3 inch. Differences of this kind must of necessity lead to a great confusion in comparing objectives with one another. I would therefore suggest that each objective made should be measured before being offered for sale, that this confusion may cease to exist. A convenient arrangement would be to fix a glass scale divided to 1-50 or 1-100 inch in the draw-tube, sliding in the tube of the microscope, and measure as I have already described. The draw-tube should be moved till the front of the ruled glass shall be exactly 10 inches from the micrometer used as the object. Or it would be more convenient still to have an apparatus similar to the first form, but arranged with a suitable stage and stand so that it can be set at any desired angle. The distance 10 inches (254mm.), suggested as a standard is chosen because it is the normal distance of distinct vision, as well as about the length used by microscopists in actual work."



ANTHROPOLOGY.

PERUVIAN ARCHÆOLOGY. — The extent to which the conditions of mankind are influenced by natural circumstances, and how these may dictate, not alone the architecture and arts of a people, but their social, religious and political organizations, is perhaps nowhere better illustrated than in Peru. The Inca Empire, it seems to me, was only rendered possible by the peculiar geographical and topographical position occupied by the family or families that were its founders. Long antedating that empire its vast area contained a great number of communities, tribes, or principalities, more or less advanced or civilized, separated from each other,